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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,968	01/22/2002	Dennis P. Long	94004-88216	5193

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EXAMINER

CAMPBELL, THOR S

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 01/06/2004

11

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/053,968

Applicant(s)

LONG ET AL.

Examiner

Thor S. Campbell

Art Unit

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____.

Art Unit: 3742

DETAILED ACTION

Response to Amendment

Applicant's request for reconsideration of the finality of the rejection of the Office action of July 15, 2003 is persuasive and, therefore, the finality of that action is withdrawn. As such applicant's amendment filed December 03, 2003 has been entered. An action on the merits of the claims amended on 05/07/03 and 12/03/03 follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 8-11, 13-14, 17, and 29-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Tavender et al. (US 2878360).

Tavender discloses a fluid heat exchanger comprising an inside tube 11b, a concentrically surrounding outside tube 11a defining an small passageway of annular cross section therebetween, a temperature control system comprising a thermistor in the fluid passageway for monitoring and controlling the temperature of the fluid within a predetermined range, said inner tube comprising an electric heater coil therein, a helically coiled wire interposed between said inner tube and said outer tube, the outer tube surrounded by insulation in the form of housing 15a. With respect to claim 14, the limitation that the heated fluid be carbon dioxide is considered and intended use and does not serve to distinguish over the art meeting the structural requirements of the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tavender in view of Chen et al. (US 6068703).

Tavender discloses a fluid heat exchanger comprising an inside tube, a concentrically surrounding outside tube defining an small passageway of annular cross section, wherein both tubes have at least one portion having an axial curvature, a temperature control system for monitoring and controlling the temperature of the fluid within a predetermined range, said inner tube comprising an electric heater coil therein, a helically coiled wire interposed between said inner tube and said outer tube. Tavender does not explicitly disclose a electropolished finish to the surfaces of the fluid channel.

Chen discloses a fluid mixing device having electropolished surfaces in contact with the fluids in order to remove undesired surface irregularities along the fluid flow path. It would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of Chen, to modify the device of Tavender to provide electropolished surfaces in order to remove undesired surface irregularities along the fluid flow path allowing for an ultra pure means of heating the fluid.

Claims 12, 15, 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tavender.

Art Unit: 3742

Tavender disclose the claimed invention except the raised portions on the inner and outer tubes extending into the fluid passageway. It is noted that Tavender discloses a helical wire interposed between the inner and outer tubes, applicant claims a helical raised region along the tubes, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the helical wire as an integral part of the tube surfaces in order to reduce the steps in manufacturing the device since it has been held that forming in one piece an article which has formerly been in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893).

Claims 19-27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tavender in view of Grant et al. (US 6516142).

Tavender discloses a fluid heat exchanger comprising an inside tube, a concentrically surrounding outside tube defining an small passageway of annular cross section, a temperature control system for monitoring and controlling the temperature of the fluid within a predetermined range, said inner tube comprising an electric heater coil therein, a helically coiled wire interposed between said inner tube and said outer tube. Tavender does not explicitly disclose a temperature sensor within the outer tube.

Grant discloses a temperature sensor (thermocouple 702) within an outer tube in sensing contact with fluid flow and not in direct sensing contact with the heating means. Though not explicitly disclosed, the microprocessor controller is common practice and is considered to be implicitly disclosed based on the description of the "loop control" system of Grant. It is noted that in the art of heating thermistors, resistance temperature sensors and thermocouples are considered to be equivalents under the doctrine of equivalents and are therefore included in the

Art Unit: 3742

disclosure of Grant. It would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of Grant, to modify the device of Tavender to include the temperature sensor from the group of equivalent sensors within the outer tube such that the temperature of the fluid is more accurately monitored rather than the temperature of the heater or outer tube.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tavender in view of Grant and further in view of Balma et al. (US 5178651).

Tavender in view of Grant discloses the claimed invention as described above with respect to claim 20, except the temperature sensor positioned in a raised region of the outer tube. Balma discloses the thermocouple positioned in a raised region on the inner surface of the outer tube of a fluid heating device. It would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of Grant and Balma, to modify the device of Tavender to provide a temperature sensor in a raised region on the inner surface of the outer tube to provide a convenient means of sensing the temperature at a location intermediate the ends of the fluid path.

Response to Arguments

Applicant's arguments filed 12/03/03 regarding the Office Action of 07/15/03 and the Advisory Action of 11/04/03 have been fully considered but they are not persuasive. Applicant's arguments regarding claims 1-11, 13-14, 17, and 19-34 are moot on the grounds of the new rejection. Applicant's arguments with respect to claims 12, 15, 16, and 18 are not persuasive since the Examiner maintains it to be obvious to make a structural component integrally as one piece when it was formerly made of two separate pieces.

Art Unit: 3742

Applicant's amendments of 5/07/03 and 12/03/03 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thor S. Campbell whose telephone number is 703-306-9042. The examiner can normally be reached on Tue-Fri 5:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Look can be reached on 703-308-1044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9302.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0861.

TSC


THOR CAMPBELL
PATENT EXAMINER